

8 – hot runner nozzle assembly  
10 - preferred embodiment  
12 – heater assembly  
14 – nozzle body  
16 – channel  
18 – connector sleeve assembly  
20 – nozzle tip  
22 – conductor  
24 – slot  
26 – dielectric layer  
28 – resistive layer  
30 – locating hole  
32 – insulation layer  
34 – substrate  
35 – detent groove  
36 – connector housing  
37 – first contact groove  
38 – locking detent assembly  
39 – second contact groove  
40 – contact  
42 – key  
44 – detent pin  
46 – detent spring  
48 – low resistance conductive trace  
50 – resistive trace  
52 – contact pads  
54 – passageway  
56 – wound cable heater temperature profile  
58 – copper sleeve heater temperature profile  
60 – optimized computer temperature profile  
62 – preferred embodiment temperature profile

Please ~~replace~~ paragraphs beginning at the pages and line numbers listed with the following paragraphs.

Pg ~~12~~ ln 18

R2  
Referring now to FIG. 2a, 2b, 2c, and FIG. 3, the heater assembly 12 is shown. The heater assembly 12 comprises an optional slot 24, a locating hole 30, a substrate 34, a thick-film dielectric layer 26, a thick-film resistive layer 28, at least a pair of contact pads 52 and an insulation layer 32. The heater assembly 12 comprises various layers of different materials. The substrate 34 in the preferred embodiment is a C-shaped piece of metal, typically made from steel or other thermally conductive material. The optional slot 24 runs the length of the heater and allows the substrate to act as a self clamping spring when installed around the nozzle body 14. In the preferred embodiment the substrate 34 is made from 430 stainless steel machined from solid bar or tube to have approximately 0.020" to 0.040" thick cylindrical wall.

Pg 16 ln 2

R3  
During the formation of the conductive trace 48, at least two contact pads 52 are formed from the same material. The contact pads 52 in the preferred embodiment are located at each end of the resistive layer 28 and provide a place to apply electrical power to the heater assembly 12. The contact pads 52 are located in a predetermined position on the heater assembly 12 for interface with the connector sleeve assembly 18 when the sleeve is fully installed and locked in place.

Pg ~~16~~ ln 10

R4  
Applied over the resistive layer 28 is the insulation layer 32 also using a silk-screen process. The insulation layer 28 is not applied over the contact pads 52. The insulation layer 32 is a mechanical, thermal and electrical insulative substance that protects the resistive layer 28 from abrasion and electrical shorts and reduces heat loss from the outside surface of the heater. The insulation layer 32 comprises a glass matrix which is fired at a temperature of approximately 600<sup>0</sup> C.

Pg 16, In 26

25 The connector housing 36 is an annular shaped plug that will slidably engage the outside diameter of the heater assembly 12. A key 42 on the inside diameter of the housing 36 interfaces with the slot 24 and properly aligns the sleeve assembly 18 with the contact pads 52. The first and second contact grooves 37 and 39 are formed on the inside surface of the connector housing 36 for the insertion of spring contacts 40. The passageways 54 allow for the installation of the conductors 22 through the wall of the housing 36 for connection to the contacts 40.

Pg 17, In 5

26 The connector housing 36 in the preferred embodiment is made from a pressed and fired 96% dense alumina ceramic material. This material currently offers properties that are best suited for high temperature environments and exhibits electrical and thermal insulative properties. It could however be easily manufactured from any suitable material that possesses high dielectric properties and low thermal conductivity.

Pg 17, In 13

27 The connector housing 36 is an annular shaped plug that will slidably engage the outside diameter of the heater assembly 12. A key 42 on the inside diameter of the housing 36 interfaces with the slot 24 and properly aligns the sleeve assembly 18 with the contact pads 52. The first and second contact grooves 37 and 39 are formed on the inside surface of the connector housing 36 for the insertion of spring contacts 40. The passageways 54 allow for the installation of the conductors 22 through the wall of the housing 36 for connection to the contacts 40.

Pg 18 In 2

28 Referring to FIG. 4, FIG. 5 and FIG. 8, the locking detent assembly 38 is shown. The detent assembly 38 is inserted in the detent groove 35. The detent groove 35 runs the